WATER-BALLOON CONTEST

Every year Western High School holds a water-balloon competition during halftime of their homecoming game. Each contestant uses a catapult to launch a water balloon from the ground on the football field. This year, you are the judge! You must decide which contestants win the prizes for *Longest Distance* and *Highest Launch*. Fortunately, you have a computer that will collect data for each throw. The computer uses x to represent horizontal distance in yards from the goal line and y to represent the height in yards.

The announcer shouts, "Maggie Nanimos, you're up first!" She runs down and places her catapult at the 3-yard line. After Maggie's launch, the computer reports that the balloon travelled along the parabola
$y = -x^2 + 17x - 42$.

The you hear "Jen Erus, you're next!" Jen runs down to the field, places her catapult at the goal line and releases the balloon. The tracking computer reports the path of the ballon with the graph below.
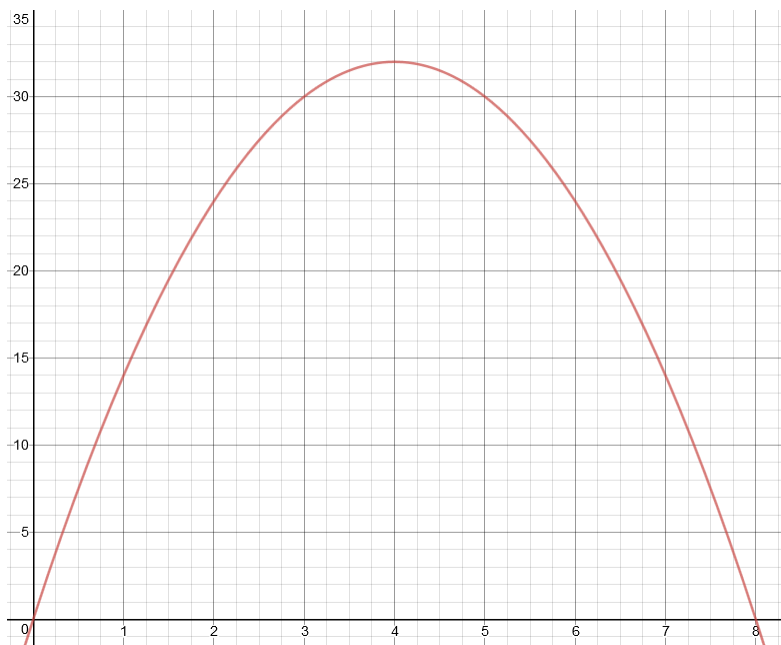
The third contestant, Imp Ecable, accidentally launches the ballon before you are ready. The balloon launches, you hear a roar from the crowd, turn around, and... SPLAT! The balloon soaks you and your computer! You only have time to write down the following partial information about the balloon's path before your computer fizzles:

x (yards)	2	3	4	5	6	7	8	9
y (yards)	0	9	16	21	24	25	24	21

Finally the announcer calls for the last contestant, Al Truistic. With your computer broken, you decide to record the balloon's height and distance by hand. Al releases the balloon from the 10-yard line. The balloon reaches a height of 27 yards and lands at the 16-yard line.

1. Find the x-intercepts of each parabola. What information do the x-intercepts tell you about each balloon toss?

2. Find the vertex of each parabola. What information does the vertex tell you about each balloon throw?

3. Which contestant should win the *Longest Distance* and *Highest Launch* awards? Show your work and explain your answer.